

DOCUMENT RESUME

ED 160 008

HE 010 474

AUTHOR Ledford, Bruce R.
 TITLE The Effects of Thematic Content of Rheostatically Controlled Visual Subliminals Upon the Receiving Level of the Affective Domain of Learners.
 SPONS AGENCY East Texas State Univ., Commerce.
 PUB DATE Aug 78
 NOTE 129p.; Photographs will not reproduce clearly
 AVAILABLE FROM Bruce R. Ledford, Center for Educational Media and Technology, East Texas State University, Commerce, Texas 75428
 EDRS PRICE MF-\$0.83 HC-\$7.35 Plus Postage.
 DESCRIPTORS *Affective Tests; *Arcusal Patterns; Attention; College Students; Curiosity; Experiments; Higher Education; Instructional Aids; *Interest Research; *Pictorial Stimuli; Psychological Studies; Sexuality; Slides; *Student Behavior; Violence; *Visual Perception

ABSTRACT

The purpose of the study was to determine the effects of rheostatically controlled visual subliminals on the affective interrelations of a learning task of subjects within a classroom setting. Four groups of students were used. Subjects were unknowingly exposed to a rheostatically projected subliminal message for 30 minutes during otherwise normal classroom procedures. Subjects were then asked to complete a questionnaire revealing their consciousness of, willingness to learn about, and desire to elicit selective attention to faces shown on six slides, one being the subliminally prescribed task. Of the stimuli content tested, a drive-related sex stimulus was the more significant in affective influence.

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THE EFFECTS OF THEMATIC CONTENT OF RHEOSTATICALLY
CONTROLLED VISUAL SUBLIMINALS UPON THE
RECEIVING LEVEL OF THE
AFFECTIVE DOMAIN
OF LEARNERS

by

Bruce R. Ledford, Ed.D.

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Submitted to the Office of Organized Research of
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Research Grant 1501-9718
August, 1978

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ABSTRACT

THE EFFECTS OF THEMATIC CONTENT OF RHEOSTATICALLY CONTROLLED VISUAL SUBLIMINALS UPON THE RECEIVING LEVEL OF THE AFFECTIVE DOMAIN OF LEARNERS

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Purpose of the Study: The purpose of this study was to determine the effects of rheostatically controlled visual subliminals upon the affective interrelations of a learning task of subjects within a classroom environment. The study was also concerned with the effects of subliminal stimulation upon other learning tasks other than the one prescribed by such stimulation.

Procedure: Subjects were unknowingly exposed to a rheostatically projected subliminal message for thirty minutes during otherwise normal classroom procedures. After this stimulation period subjects were asked to complete a questionnaire revealing their consciousness of, willingness to learn about, and desire to elicit selective attention to, faces shown on six slides, one being the subliminally prescribed task. This questionnaire was of the experimenter's own design and based on Krathwohl's et al. Affective Domain Taxonomy. Group 1, the control group, received no subliminal stimulation, only the posttest. Group 2 received stimulation of a neutral nature. Group 3 received a drive-related death stimulus and Group 4 received a drive-related sex stimulus. Data were collected and recorded on computer punch cards and analyzed by the Biomed package utilizing a one-way analysis of variance, the t-test, and the Pearson Product-Moment correlation, r.

Findings: The general findings of the study were:

1. Sex-oriented visual subliminal messages make learner's willing to submit controlled attention to a prescribed learning task.
2. No significant differences were found in learner's attitudes toward a prescribed learning task when subject's responses were evoked by a drive-related death subliminal stimulus or a neutral subliminal stimulus.
3. There was no statistically significant correlation indicating effect of the subliminal stimulation upon learner's attitudes toward a learning task other than the one subliminally prescribed.

Conclusions: The general conclusions of the study were:

1. Of the stimuli content tested, a drive-related sex stimulus was the more significant in affective influence.
2. Recommendations were made that experimentation concerning duration times, intensity levels, and the overall effects of rheostatically controlled visual subliminals be made to investigate the place of the rheostat in instructional design theory and application.

ACKNOWLEDGEMENTS

The researcher's assistant, John McCormack, has made invaluable contributions to the study. His diligence, mental acquisitiveness, and inimitable creativity have been primary to the research effort.

The researcher also acknowledges Drs. Wilson Key and Marshall McLuhan for their comments and support relevant to the formulation of this study; Dr. Dickie L. Fox for his assistance with the computer; Dr. Bill Ogden for his guidance in developing the prospectus; Drs. Robert Sanders, Barbara Hammack, Joan Cocklereas, and Tom Gorsuch for their assistance in procuring subjects for the study; Dr. Beatrice Murphy for providing logistical support from the Center of Educational Media and Technology; Dr. H. M. Lafferty and the Office of Organized Research for the opportunity to conduct the study; and, Margaret Nicholson for typing the final report.

Finally, to my colleagues in the Center for Educational Media and Technology, and to colleagues across the university who have demonstrated a high level of interest in and support of the research project, the researcher should like to acknowledge his gratitude and indebtedness.

Dr. Bruce Ledford
August 8, 1978

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Chapter 1

INTRODUCTION

According to Carl Jung, humankind is laboriously developing consciousness. Of man's 50,000 years existence only the most recent 6,000 years show any documentable evidence of literacy.¹ Only during these last 6,000 years has man been capable of communicating from one lifetime to another. This altered state of consciousness has been attributed to the evolution of linear thought processes under the dominance of the left hemisphere of the brain. With this linear format links were made to connect the past, the present, and the future. These linear thought processes lay as groundwork for an organization of relationships between and among phenomena whereby a system of living was deduced as having logical consequences. Yet even in the rational world of linear logic, the less-developed right hemisphere of the brain provided the necessary creative insights and intuitive abilities to discern the esoteric mysteries of living.

Current research abounds with evidence to support

¹Alvin Toffler, Future Shock, (New York, N.Y.: Bantam Books, 1971), p. 14.

Jung's concept of consciousness as an evolutionary state still within the throes of change. Recently psychiatrists and physicians have determined a higher state of consciousness is developing as the right hemisphere of the brain is now becoming the dominant.²

Consciousness, in its various guises, is at all times frail and thereby easily injured. A dissociation of consciousness is a common mental derangement. Moods are common to everyone and usually the person having the mood is at a loss to determine what stimuli has brought about this feeling. Thus moods can be the result of unconsciously perceived or unrecognizable stimuli.

Similarly, anthropologists have noted in many primitive societies that consciousness is considered the workings of varied "bush souls." These "bush souls" contain a person's psychic identity. This identity can be lost, or fragmented, under the on-slaught of unchecked emotions. Consciousness is always open to fragmentation. Perceptions, innumerable and overlapping, find the consciousness having to deal simultaneously with a variety of sensations. The ability of a person to isolate even a portion of one's mind, a linear process, is a necessary ability to perform a prescribed task. Yet this concentrating on one filtered sensation at the exclusion of other competing stimuli is an over-simplification of the

²From statements made by Marshall McLuhan in the film Educational Directions: Where Do We Go From Here?, Produced by East Texas State University and Phi Delta Kappa, 1977.

reality of the learning process and leaves untreated the myriad of perceptions that the conscious mind has decided to de-emphasize in order to accent the conscious task. Left unanswered are the effects of the restricted stimuli on the learning task and of the consciousness as a whole.

Man never perceives or comprehends anything absolutely. Perception is the foundation of learning. Yet, how well one perceives depends upon the individual's quality and quantity of sensory abilities. To interpret from sensory perception and derive meanings is affected not only by the actual physical state of the perceptions but how such experiences are intergrated by other sensory experiences and of the influences of past cultural experiences. Such a complicated picture of the consciousness of the learner makes it obvious that there are an indefinite number of stimuli which are unknown to both the educator and the learner. These stimuli remain below the threshold of consciousness within the realms of the unconscious. They are absorbed subliminally; that is, without conscious knowledge.

Like all information available to the mind, within the confines of a learning task, it must be assumed that these stimuli have effects upon psycho-motor skills, cognitive abilities, and attitudes of the learner. The unconscious, the denizen of much educated guesswork since the contributions of such as Freud and Jung, holds secrets

of what influences men. Constantly occurring subliminal stimulation, registered beneath a conscious level of perception, is one vehicle which can interrupt or reinforce learning. Due to the physical limitations of men's senses there will always be stimuli beneath the level of a learner's conscious awareness which will somehow affect his learning capabilities. It is the duty of research within education to explore those factors which influence the learner and his learning environment. To ignore the existence of subliminal stimuli, their reception by the learner, and their subsequent effects, is to make the assumption that the psyche is total. Those who reject the existence of subliminal stimulation merely express a misoneism.³

STATEMENT OF THE PROBLEM

The purpose of this study was to determine if the receiving level of the affective domain of learners could be affected by the presentation of rheostatically controlled visual subliminals. A sub-problem to the study was whether a learner's attitude toward learning tasks, other than the task prescribed by the content of the subliminal stimulation, could be affected by the presentation

³Carl Jung, Man and His Symbols, (Garden City, N.Y.: Doubleday and Co., 1964), pp. 18-104.

of rheostatically controlled visual subliminals.

IMPORTANCE OF THE STUDY

Visual stimuli subliminally transmitted to human subjects have caused a statistically significant number of them to react to suggestions presented by the stimuli. To effect learning, that which can be defined as a desired behavioral change that is relatively stable for a relatively extended period of time and is void of undesirable side effects, is the goal of education. Learning occurs within three domains: psycho-motor, cognitive, and affective. Regardless of the domain of learning, effective, efficient, and predicatable learning is predicated upon the receiving level with the affective domain; that is, the learner's awareness of, his willingness to receive, and his submission of controlled attention to the learning task.

Learner motivation has been a primary concern of educators throughout history. Yet, to date, no attempt to influence learner motivation by affecting the receiving level within the affective domain with subliminal stimulation has been reported. With the combined importance of the affective domain in learner motivation and the fact that subliminal perception is an unprogrammed variable in all learning environments, a look must be taken at the effects of subliminal suggestion upon learner's attitudinal

approaches to a learning task. Thus, the research suggests that a learner's attitudinal response to a learning task can be significantly influenced via visual subliminals rheostatically presented.)

QUESTIONS TO BE ANSWERED

It was the problem of this study to determine if the receiving level of the affective domain of learners could be affected by the presentation of rheostatically controlled visual subliminals. The following questions were posed:

1. Can a learner's level of awareness of a learning task be affected by the presentation of rheostatically controlled visual subliminals?
2. Can a learner's willingness to receive a learning task be affected by the presentation of rheostatically controlled visual subliminals?
3. Can a learner's commitment to submit controlled attention to a learning task be affected by the presentation of rheostatically controlled visual subliminals?
4. Can a learner's attitude toward learning tasks, other than the task prescribed by the content of the subliminal stimulation, be affected by the presentation of rheostatically controlled visual subliminals?

DELIMITATIONS

The subjects for the study were limited to students enrolled in psychology 131, literature and languages 201, elementary education 460, radio-television 450, and educational media and technology 461 and 561 during the Spring semester, 1978, at East Texas State University, Commerce, Texas.

DEFINITION OF TERMS

The following definitions were used within the context of this study:

Affective domain. The affective domain is defined by Krathwohl in his Affective Domain Taxonomy as that area of the learning process which "emphasize a feeling tone, an emotion, or a degree of acceptance or rejection." For "affective objectives vary from simple attention to selected phenomena to complex but internally consistent qualities of character and conscience."⁴

Subliminal perception. Subliminal perception is defined as perception which meets all Norman Dixon's criteria for a subliminal. These are "(1) stimulation below predetermined awareness limen, (2) no reported awareness of the critical stimulus (either during or after the

⁴K. R. Krathwohl, B. S. Bloom, and B. B. Masia, Taxonomy of Educational Objectives: Handbook II: Affective Domain (New York: David McKay, Co., 1964), p. 7.

experimental treatment), and (3) the evoking of responses which, shown to be contingent upon the stimulus, differ qualitatively from those evoked by the same stimulus when given supraliminally."⁵

Receiving level. The receiving level is the initial step in the learner's encountering of affective information. This includes the first interfacing which is termed "awareness", the subject's knowledge of his awareness and personal effort to become one with the learning experience or "willingness to learn", and the focusing of his personal attention on the learning task or "controlled selected attention".⁶

Rheostat. The rheostat is an instrument which regulates and manipulates projected light levels. Since the setting of light levels is an additive process, low level projections within available light can be made to project stimuli at visual levels below awareness thresholds.

ASSUMPTIONS

The following assumptions were made in the course of this study:

1. The subjects selected for inclusion into this study were representative of learners in a classroom

⁵Norman Dixon, Subliminal Perception: The Nature of a Controversy (London: McGraw-Hill, 1971), p. 27.

⁶Krathwohl, et al. pp. 98-113.

environment.

2. The choices made by the subjects as measured by the Likert-type scale are valid measures of affective disposition as defined by Krathwohl.

HYPOTHESES

The following null hypotheses were developed to test the effects of rheostatically controlled visual subliminals upon the receiving level of the affective domain of learners:

Hypothesis I. There will be no statistically significant difference between the control group (1) and the neutral stimulus group (2) for knowledge of the existence of the learning task.

Hypothesis II. There will be no statistically significant difference between the control group (1) and the neutral stimulus group (2) for the willingness to receive a learning task.

Hypothesis III. There will be no statistically significant difference between the control group (1) and the neutral stimulus group (2) for the submission of controlled attention to a learning task.

Hypothesis IV. There will be no statistically significant difference between the control group (1) and the drive related (death) stimulus group (3) for the knowledge of the existence of the learning task.

Hypothesis V. There will be no statistically significant difference between the control group (1) and the drive related stimulus (death) group (3) for the willingness to receive a learning task.

Hypothesis VI. There will be no statistically significant difference between the control group (1) and the drive related stimulus (death) group (3) for the submission of controlled attention to a learning task.

Hypothesis VII. There will be no statistically significant difference between the control group (1) and the drive related (sex) stimulus group (4) for the knowledge of the existence of the learning task.

Hypothesis VIII. There will be no statistically significant difference between the control group (1) and the drive related stimulus (sex) group (4) for the willingness to receive a learning task.

Hypothesis IX. There will be no statistically significant difference between the control group (1) and the drive related stimulus (sex) group (4) for the submission of controlled attention to a learning task.

Hypothesis X. There will be no statistically significant correlation between learner attitudes subliminally prescribed and learning tasks not subliminally prescribed.

PROCEDURE

A Likert-type questionnaire was developed to conform with the outlines of Rensis Likert,⁷ with particular applications prescribed by Krathwohl⁸ for the developing of a testing instrument for a learner's receiving of affective stimuli. The subjects tested consisted of 123 students enrolled in psychology, radio-tv, literature and languages, elementary education, and educational media and technology classes at East Texas State University in Commerce, Texas. The environment was arranged and the appropriate stimuli were presented to each group. Data were collected, recorded on computer punch cards, and analyzed by the Biomed Package.

The principal independent variables in the study consisted of the message and the orientation of each subject within each group. The dependent variable was the subjects attitudes toward a learning task. These attitudes were reflected in responses given to statements on the instrument which consisted of selecting a position on a five-point scale.

Significant relationships between the control

⁷Rensis Likert, "The Method of Constructing an Attitude Scale," Scaling: A Sourcebook for Behavioral Scientists, ed. G. M. Maranell (Chicago: Aldine Pub. Co., 1974), pp. 223-243.

⁸Krathwohl, et al. pp. 98-113.

group and each of the experimental groups toward a learning task were statistically determined by using a one-way analysis of variance to compare the group mean. Significance was set at the .05 level. Within each group, the correlation between the motivational level of the prescribed learning task and other learning tasks was made using the Pearson Product-Moment correlation, r . Significant correlation was determined at the .75 value or above, or the -.75 value or below. Moderate correlation was determined to be at the .25 to .74 value or the -.25 to -.74 value. The range -.24 to .24 was considered of no significant correlation.

The findings of the study were summarized. Conclusions and recommendations for further research were made, based on an analysis of the data.

OUTLINE OF THE REMAINDER OF THE STUDY

Chapter 2 reviews the literature related to the study. The research procedures employed in the study are described in Chapter 3. Chapter 4 presents an analysis of the data. The summary, conclusions, and recommendations for further research are contained in Chapter 5.

Chapter II

REVIEW OF LITERATURE

INTRODUCTION

A careful review of the related literature found no direct evidence of any experimentation with subliminal stimulation and affective influences of subjects toward learning tasks. Also, the literature indicated no evidence of investigations into the possible affective influences of subliminal perception specifically as a controlled variable in a classroom environment. There are, however, research findings which do present information on the effects of subliminal suggestion to influence subjects' attitudes.

Currently there is no research, whatever its focus, "which has shown that subliminal stimuli may evoke reports of affect or felt emotions. There are, on the other hand, numerous studies which have successfully employed physiological concomitants of emotion as indicators of subliminal effect."¹

¹Dixon, p. 166.

PERCEPTUAL DEFENSE THEORY

Of the many possible explanations available as insights into the workings of the subliminal perception phenomenon, the concept of perceptual defense is the most respected. Eriksen defined perceptual defense as the self, or ego, being responsible for "the selection and screening of stimuli" and that perceptual defense was based on an assumption that stimuli are capable of threatening that self, or ego. He does, however, believe that stimuli which are acceptable receive little or no inhibition in their conscious or overt expression. "Here acceptable stimuli would lower perceptual defenses and allow for easy signaling of motor systems. Threatening stimuli would activate ego defenses, lower thresholds, and keep much of the information from the conscious."²

Due to the defection of a few early proponents of the perceptual defense, Blum tested subjects with stimuli that were related to threats in sexual concept. His findings were that "perceptual defense can be traced directly to the perceptual process itself. With the variables of familiarity, set, and selective verbal report all controlled, an avoidance response to a subliminal stimulus has taken place. Apparently the subject makes

²C. W. Eriksen, "Perceptual Defense as a Function of Unacceptable Needs," Journal of Abnormal and Social Psychology, 46, 1951, p. 557.

an unconscious visual discrimination which somehow cues off an avoidance reaction." Hence, "current attempts to abandon perceptual defense in the interests of 'theoretical parsimony' may be very premature."³

Key, in his popular book Subliminal Seduction, spoke of perceptual defense mechanisms within the "human brain and nervous system (that) provided one of the most curious and significant explanations of subliminal response behavior available." Here, subliminal messages, particularly those which threaten the subject are "side-tracked into the unconscious."⁴ Once within the unconscious the message is not quickly abandoned. It may lie dormant for a period of days, or possibly weeks, and then make itself known by associative behavior known as the Poetzl effect. Dixon defended the perceptual defense concept because it was the only one of the more suggested solutions which was not made questionable by the many experiments which had no apparent bias operating, had associatively related subject responses that are unlike supraliminal answers evoked during similar conditions, had significant emotional changes in subjects, or were in line with the finding that the more subliminal the stimulus

³G. S. Blum, "Perceptual Defense Revisited," Journal of Abnormal and Social Psychology, 51, 1955, pp. 27-29.

⁴W. B. Key, Subliminal Seduction, New American Library: Englewood Cliffs, 1973, p. 38.

the greater its effect.⁵ Kleespies and Weiner stood as mediators between proponents of the partial-cue analysis, the most recognized alternative to the perceptual defense outlook, and perceptual defense enthusiasts by proclaiming that the differences are more attuned to the epistemological determination of the experimenter than empirical in nature.⁶

The Drive-Related Stimuli

Symbols that threaten the subject alert perceptual defenses. Research studies showed these to be drive-related. Pointing to Jung's theories of inner psychic pattern's within the collective consciousness of man are archetypal symbols which are the "common denominators of all the world's known cultures are organized around two polarities of life: first the origin of life, procreation, love, or - in the Playboy vulgarization - sex, the end of life, death, and its related implications of aggression and violence."⁷

Key's books described a subconscious level of advertising where ads are virtual mosaics of taboo words and graphically sexual and symbolic pictures to arouse

⁵Dixon, p. 244.

⁶P. Kleespies, and M. Weiner, "Some Comments and Data on Partial Cue Controversy and Other Matters Relevant to Investigations of Subliminal Phenomena: A Rejoinder," Perceptual and Motor Skills, 27, 1968, pp. 847-861.

⁷Key, p. 58.

the repression of instincts of consumers. Death images lurk in liquor ads and cigarette come-ons threaten unknowing customers. Miles Olsen, in a paper presented at the annual meetings of the conference on English Education in Colorado Springs, Colorado, in 1975, supported Key's fantastic claims that magazine ads now employ embedded images routinely.

The Associative Response

Dixon's definition of subliminal suggestion, the definition utilized by this study, stated that to be subliminal there must be "(1) stimulation below predetermined awareness limen, (2) no reported awareness of the critical stimulus (either during or after the experimental treatment), and (3) the evoking of responses which, shown to be contingent upon the stimulus, differ qualitatively from those evoked by the same stimulus when given supraliminally."⁸ Dixon distinguished between an awareness level and a recognition level. This allowed for analysis of both those experiments just below and just above the perceptual threshold by this study.

The third criteria demanded that for a perception to be deemed subliminal it must show evidence that it will evoke a different, more associative response, than a supraliminal, conscious perception. Dixon conducted an

⁸Dixon, p. 27.

experiment where subjects were asked to say "the first word that comes to mind" every time that a spot of light appeared on a screen before them. Each of these spots of light was preceded by the presentation of a subliminal cue word. Galvanic skin responses were measured during each stimulus presentation. Three findings were concluded: 1. Galvanic skin responses recorded during each subliminal presentation were significantly higher for emotionally drive-related words than were recordings for the neutral stimuli; 2. When subjects were asked a week later to match their responses against the stimuli words at a supraliminal level, they did match responses significantly beyond chance functions; and 3. "it was found that a significant number of responses were matched against the synonym of the original stimulus word. For example, the response 'eject' given during subliminal stimulation with the words 'male sex organ' was subsequently paired with 'penis' while similar synonymous matches were made for 'nostril' and 'bloodshed' (responses to 'vagina' and 'female sex organ', respectively.)"⁹

Dixon's study revealed the evidence of the emotional impact of threatening words, the associative response pattern that they engender, and the storing or "time-clock" capacity of the Poetzl effect.

⁹Dixon, pp. 73-74.

Poetzl Effect

This Poetzl effect was discovered by Otto Poetzl in 1917.¹⁰ Poetzl related dream experiences as the associative reaction of the unconscious to subliminal stimuli previously perceived. Poetzl reported such delayed dream associations evoked days or weeks after the testing. Poetzl's experimentation has been replicated in recent years by Fisher (1954,1956)^{11,12} and Shevrin and Luborsky (1958)¹³ with similar results as those obtained in the original testing. Similarly, Key reported his study in which slides were taken from the screen of the Exorcist, a contemporary movie renown for its supposive use of subliminals, found subjects given to very emotional immediate reactions. During the following week over half reported nightmares which "were unusual and vivid horror dreams clearly related to the movie" such as being tortured or sexually involved with the devil.¹⁴

¹⁰O. Poetzl, "The Relationship Between Experimentally Induced Dream Images and Indirect Vision," Monograph (No. 7) Psychological Issues, 2, 3, 1960, pp. 41-120.

¹¹C. Fisher, "Dreams and Perception," Journal of American Psychoanalysis Association, 2, 1954, pp. 389-445.

¹²C. Fisher, "Dreams, Images and Perception: A Study of Unconscious Preconscious Relationships," Journal of American Psychoanalysis Association, 4, 1956, pp. 5-47.

¹³H. Shevrin and L. Luborsky, "The Measurement of Preconscious Perception in Dreams and Images: An Investigation of the Poetzl Phenomenon," Journal of Abnormal and Social Psychology, 56, 1958, pp. 285-294.

¹⁴W. B. Key, Media Sexploitation, New American Library, 1976, p. 101.

ASSOCIATIVE RESPONSE
STUDIES

Bach¹⁵ investigated the differences in response to the same stimuli presented supraliminally, subliminally, and incidentally. The words "room" and "water" were chosen as being classically considered by psychological standards as symbols for motherhood. Thirty-six female college students were divided into three groups. One group viewed the words at a supraliminal level, one at a subliminal level, and the third as "accidentally exposed" cues. Subjects were asked to write twenty words that they associated to control and experimental stimuli. Judges scored the responses, subtracting the number of mother associations found on control stimuli. Scores of the three groups, after each respective control scores were subtracted, showed that subjects in the subliminal and incidental groups had significantly larger numbers of motherhood associations than the supraliminal group. Supraliminal responses to "wall" tended toward such answers as "ceiling" while subliminal and incidental groups were more inclined to mention female-motherhood connotations. Subliminal levels were maintained in the sub-threshold group by presenting red-lettered stimuli under

¹⁵S. Bach, "Symbolic Associations to Stimulus Words in Subliminal, Supraliminal, and Incidental Presentations," (unpublished Ph.D. dissertation, New York University, 1960).

red illumination at an intensity below subjects' reported awareness level.

McGinnies transmitted and measured the physiological responses of subjects with galvanic skin response equipment. Two types of words were used. One group of words were considered emotionally neutral and the other was chosen to bring about psychological and physiological responses. These were words with high emotional loading including "bitch", "whore", and "rape". McGinnies reported the taboo words evoked a decided skin response.¹⁶

The McGinnies study was replicated by Lazarus and McCleary. Instead of neutral and taboo word, nonsense syllables were substituted. Ten five-letter nonsense words were chosen and five of those words were randomly paired with electrical shocks. These words were then presented to the subjects on a conscious level for a one second duration and they were subjected to an accompanying electrical shock. The remaining five words were presented without shocks for the same duration. The second phase of the experiment subjected the same subjects to the same nonsense syllables, but this time at subliminal levels were via a tachistoscope without an electrical shock. The words were presented randomly. Even though the shocks were

¹⁶E. McGinnies, "Emotionality and Perceptual Defense," Psychological Review, 56, 1949, pp. 244-251.

no longer present, the subjects responded to these five stimuli with increased galvanic skin response readings.¹⁷

Shevrin and Fisher studied the changes in the effects of a waking subliminal stimulus as a function of both dreaming and non-dream related sleep. A subliminal picture was flashed of a knee and a pen. A subliminal technique was used which elicited primary and secondary levels of responses to the same stimulus. The first, level evoked more logical reactions to subliminal perceptions. The secondary, the dreaming portions of sleep, were more prone to associative reactions to the stimulus. For instance, the word pen on the conscious level was prone to be recalled to be "ink", "paper", and knee as "leg" or "bone". At the secondary or rebus level it was prone to be recalled as "money" or "coin", or "round" as in association with penny (pen-knee).¹⁸

Kleespies and Weiner explored for evidence of visual input at subliminal exposure durations by studying eye movements, and whether the response, if any, was a function of the thematic content of the stimulus. There was no evidence that there was an input difference of

¹⁷R.S. Lazarus and R. A. McCleary, "Autonomic Discrimination Without Awareness: A Study of Subception," Psychological Review, 58, 1951, pp. 113-122.

¹⁸H. Shevrin and C. Fisher, "Changes in the Effects of a Waking Subliminal Stimulus as a Function of Dreaming and Non-dreaming Sleep," Journal of Abnormal Psychology, 72, 4, 1967, pp. 362-368.

threatening versus neutral thematic content.¹⁹

Blum predicted that a subject would defend against a threatening stimulus which is presented just below the threshold and be vigilant toward the same stimulus when it is farther below the same threshold. Jennings and George replicated the study and found no coinciding evidence. Blum criticized the replication on the grounds that it was not sound in method.²⁰

In a series of studies, Shevrin reported that the effects of subliminal perception are encoded in the average evoked response. Two stimuli were presented tachistoscopically with varied levels and durations of exposure. At no exposure duration did average evoked response measures discriminate between the stimuli. Thus, there was no evidence for either subliminal or supraliminal discrimination of stimulus content by average evoked response.²¹ However, Schwartz and Rem argued that Shevrin's criticisms are factually and theoretically erroneous and

¹⁹P. Kleespies and M. Weiner, "The Orienting Reflex as an Input Indicator in Subliminal Perception," Perceptual and Motor Skills, 35, 1, August, 1972.

²⁰L. B. Jennings and S. G. George, "Perceptual Vigilance and Defense Revisited: Evidence Against Blum's Psychoanalytic Theory of Subliminal Perception," Perceptual and Motor Skills, 41, 3, December, 1975, pp. 723-729.

²¹M. Schwartz and R. Rem, "Does the Averaged Evoked Response Encode Subliminal Perception?" Psychophysiology, 12, 4, July, 1975, pp. 390-394.

that a reanalysis of the data confirms the original conclusions.²² Shevrin countered with the criticism that the attempt by Schwartz and Rem to replicate his studies was limited.²³

SEX RELATED DRIVE STIMULUS STUDIES

Silverman, Kwawer, Wolitzky, and Coron tested psychoanalytic dynamic propositions through the subliminal exposure of drive related stimuli, using 2 groups, one of male homosexuals, and one of male heterosexuals. On the basis of both psychoanalytic clinical reports and the results of preliminary investigation, it was hypothesized that male homosexuals would show an intensification of homosexual related reactions after the subliminal presentation of an "incest stimulus", and a decrease on such reactions after the subliminal exposure of a "symbiosis stimulus". It was found that for homosexuals on a "sexual feelings assessment," the incest stimulus intensified "homosexual orientation". On a Rorschach-type task, the symbiosis condition led to a decrease in a "threat index".

²²M. Schwartz, "On Testing Specific Hypotheses About Subliminal Perception: A Reply to Shevrin," Psychophysiology, 13, 1, January, 1976, pp. 27-31.

²³H. Shevrin, "Does the Averaged Evoked Response Encode Subliminal Perception? Yes. A Reply to Schwartz and Rem," Psychophysiology, 12, 4, July, 1975, pp. 395-398.

Neither of these results were found for heterosexuals.²⁴

Klein, Spence, Holt, and Gourevitch drew reference to "the special question of defense reactions to subliminal registrations as in alleged instances of perceptual defense." An effort was made in this study to make an "inquiry about nonconscious registration to a next logical step: how and in what ways do subliminal registrations affect conscious thought and within what limits?"²⁵ To test this question subliminal messages were projected tachistoscopically just prior to a longer supraliminal duration stimulus. The subliminal experimental messages, pictures of male and female genitalia and male and female symbols, were followed by the conscious image of an ambiguously sexed person. Subjects considered the ambiguous image as being more masculine when it followed a male subliminal symbol than when it followed a female symbol. Similar sexual symbols, projected on to movie screenings, were later utilized by Veeder.²⁶

²⁴L. Silverman, J. S. Kwawer, C. Wolitzky, and M. Coron, "An Experimental Study of Aspects of the Psychoanalytic Theory of Male Homosexuality," Journal of Abnormal Psychology, 82, 1, August, 1973, pp. 178-188.

²⁵G. S. Klein, D. P. Spence, R. R. Holt, and S. Gourevitch, "Cognition Without Awareness: Subliminal Information on Conscious Thought," Journal of Abnormal and Social Psychology, 57, 1958, pp. 255-266.

²⁶G. E. K. Veeder, "The Influence of Subliminal Suggestion on the Response to Two Films," (unpublished Ph.D. dissertation, Wayne State University, 1975).

Drawing on the work of Klein and his associates, Smith, Spence and Klein found a need to find if the meaning of the subliminal figures was solely responsible for these effects since the symbols differed also in shape. "Another experiment seemed necessary to test the decisive importance of meaning alone as a subliminal influence upon conscious thought, using stimuli that differed minimally in contour and maximally in meaning."²⁷ To meet this criteria of maximum meaning difference and minimal structural discrepancy words were chosen as stimuli. The words 'angry' and 'happy' were then tachistoscopically presented in a line drawing of a neutral and expressionless face. Twenty male patients were shown the words in mixed sequences of gradually increasing subliminal exposure. Descriptions of the face were significantly more pleasant when the preceeding stimulus was 'happy'. The conclusion drawn from this study was that "differences in meaning between words registered below the threshold of recognition can affect associated conscious thought; although these influences are modulated by response preferences and certain idiosyncratic reaction tendencies."²⁸

Arey, following the suggestions of Poetzl's work,

²⁷G. J. W. Smith, D. P. Spence, and G. S. Klein, "Subliminal Effects of Verbal Stimuli," Journal of Abnormal and Social Psychology, 59, 2, 1959, p. 167.

²⁸Smith, Spence, and Klein, p. 176.

and the confirmations of Fisher and Shevrin and Luborsky, saw a need to explore the concept "that stimuli apparently perceived outside of the focus of conscious awareness could later appear, symbolically transformed, in the manifest content of his subjects' dreams."²⁹ He chose an experimental group of 25 male schizophrenic from the wards of an Illinois hospital. The control group were 25 normal male subjects which were equated for age, intelligence, ethnic group, and education. Test and control stimuli were presented via tachistoscope and subjects gave precognition guesses to sex-related and control neutral stimuli. There was evidence that both groups responded with sexual type responses to the sex-related stimuli. There was evidence of significant differences between types of sexual responses made between groups with the schizophrenics having more deviation, less sustaining, and more negatively attitudinal responses than the normals. Arey concluded:

On the assumption that male schizophrenics were threatened by various aspects of sexuality than are normal males, and that the prerecognition distortions of tachistoscopically presented sexual stimuli are often indirect representations reflecting the subject's immediate affective response to the stimulus object, it was hypothesized that a group of

²⁹L. B. Arey, "The Indirect Representation of Sexual Stimuli by Schizophrenic and Normal Subjects," Journal of Abnormal and Social Psychology, 61, 1960, p. 424.

normal subjects could be differentiated from a group of schizophrenic subjects on the basis of the affective attitudes implied in the imagery of their respective prerecognition distortions.³⁰

Silverman, Klinger, Lustbader, Farrell, and Martin tested the psychoanalytically derived hypothesis that adolescent stutterers would show increased speech impairment after subliminal presentation of pictures with anal and oral aggressive themes. Subjects were male stutterers. Each subject received three sessions in which he was shown a subliminal stimulus containing an oral-aggressive, anal, or neutral theme. Speech impairment increased after subjection to the subliminal stimuli.³¹

Silverman reported laboratory experiments using a tachistoscopic subliminal message. The experiments used subliminal psychodynamic activation. Data supported the hypothesis that presentation of wish related stimuli versus presentation of neutral stimuli affects the level of manifest psychopathology. Additional support came from sixteen experiments with a similar design with over 400 persons with depression, homosexuality, or stuttering: subliminal exposure of stimuli led to intensification of pathology on a variety of psychological tests. Another

³⁰Arey, p. 431.

³¹L. H. Silverman, H. Klinger, L. Lustbader, J. Farrell, and A. D. Martin, "The Effects of Subliminal Drive Stimulation on the Speech of Stutterers," Journal of Nervous and Mental Disorders, 155, 1, July, 1972, pp. 14-21.

series of tests by Silverman with over 200 subjects led to decreased primary process ego pathology in schizophrenics by reducing conflict through activating a fantasy of symbiotic gratification.³²

DEATH-AGGRESSION DRIVE RELATED STIMULI

Eagle experimented with the difference of attitudinal influences of projecting a subliminal picture of a boy giving a cake to a man and a subliminal picture of the boy stabbing the man. These images were projected over the conscious image of the boy standing alone. When the picture of the boy stabbing was projected before the solitary picture there was evidence of more negative feelings about the conscious picture. Eagle concluded this was due to the negative connotations of unconscious perception of the stabbing picture. This conclusion was said to support the concept of registration and perception as independent processes. Eagle concluded that material can be registered without awareness and exert influences upon cognitive activity. There was significant evidence that stimuli, below a certain minimal exposure had greater effects upon the change of an attitude toward the supraliminal image as the projection level was

³²L. H. Silverman, "The Reports of My Death Are Greatly Exaggerated," American Psychologist, 31, 9, September, 1976, pp. 621-637.

lowered.³³ Gunthrie and Weiner,³⁴ as reported by Dixon, replicated this study using various pictures which depicted various degrees of angularness in a picture of a man with a gun at his head. They concluded on the strength of this study that it was not the threatening effect of the death-aggression image of the picture of the stabbing that made for audience reaction but the more angular structure of the stabbing picture than the rounder angled picture of the boy with the cake.

OTHER STUDIES OF AFFECT

Erdleyi compared the relative effectiveness of fantasy doodles and pictorial guesses in recovering initially unreported elements of a brief stimulus. Subjects were randomly assigned to fantasy, guessing, or yoked groups. The fantasy and guessing groups saw a brief composite stimulus which they attempted to recall. The yoked groups never saw the stimulus; instead each subject saw and copied the free recall drawings of a fantasy stimulus and then generated twenty guesses of the unrecalled elements. The guessing subjects recovered significantly more stimulus items in their responses than

³³M. N. Eagle, "The Effects of Subliminal Stimuli of Aggressive Content Upon Conscious Cognition," (unpublished PhD dissertation, New York State University, 1958).

³⁴Dixon, p. 60.

the fantasy subjects, while the yoked subjects responses were significantly less accurate than their fantasy counterparts.³⁵

Steiner investigated the influence of the subliminal words "sincere" and "not sincere" on an audiences attitudinal response to a filmed speaker's sincerity and effectiveness. He defined subliminal as visual stimuli below the lowest possible point of awareness. Subjects then rated speaker sincerity and effectiveness on rating scales. It was concluded that subliminal words did not effect measures of speaker sincerity or effectiveness. One conclusion that was drawn was that there was no significant relationships found between audience members' eyesight ratings, or seating arrangements and the areas of experimentation.³⁶

Post attempted to measure the utilization of subliminals to modify attitudes among teacher trainees and to test whether the Poetzl effect would be ascertained by a delay in measurement of retention. Participants were subjected to a tachistoscopically presented word "Timid"

³⁵M. H. Erdelyi, "Role of Fantasy in the Poetzl (Emergence) Phenomenon," Journal of Personality and Social Psychology, 24, 2, November, 1972, pp. 186-190.

³⁶G. E. Steiner, "An Experimental Study of the Influence of Subliminal Cue Words on Audience Responses To a Filmed Speaker's Sincerity, Effectiveness, and Subject Matter," (unpublished PhD dissertation, University of Southern California, 1959).

over one character in a film. No significant evidence was found of attitudinal effect or differences in retention of memory.³⁷

Spence and Gordon³⁸ hypothesized that severe rejection would arouse a compensatory fantasy of being fed by subjects who rated highly on a rating of correlation of eating as a response to possible rejection. Subjects were subliminally shown either a positive or neutral stimulus. Subjects were then asked to memorize a list of words, some related to the infantile nursing situation and some related to more socialized eating situations. The hypothesis was confirmed in the analysis of the importations of words which were not on the list and erroneously recalled. Dixon cites other such studies which explore the relationships between subliminal stimulation and oral themes of subjects.³⁹

SUPPORT FOR THE RHEOSTAT

Evidence was found that supports the theory that

³⁷G. L. Post, "A Study of the Effect of a Subliminal Stimulus Upon Attitudes Developed Toward a Character Portrayed in a Motion Picture Film," (unpublished Ed.D. dissertation, Oklahoma State University, 1965).

³⁸D. Spence and C. Gordon, "Activation and Assessment of an Early Oral Fantasy: An Exploratory Study," Psychological Issues, 8, 2 (Monograph No. 30), pp. 11-28.

³⁹Dixon, pp. 156-164.

the rheostat is far superior to the tachistoscope, the most utilized method of subliminal visual stimulation. This is due to the continuous long duration impercibility of the rheostatically projected image. By using Dixon's strict definition of subliminal stimulation, which demands no reported awareness of the stimulus by subjects, the utilization of the tachistoscope and its bright flash of light above the awareness level, but not above Dixon's recognition level, casts doubts on the tachistoscope as a true subliminal instrument. Post, for instance, suggested that his study would have produced similar or more conclusive results if a constant low-light projection were used in place of the flash of the tachistoscope.⁴⁰ Veeder goes on record supporting the superiority of the rheostatically controlled stimulus in a situation where films are used as background.⁴¹

THRESHOLD LEVEL DETERMINATIONS

When dealing with rheostatically controlled long term subliminal images, it is particularly important that proper threshold levels be determined. Dixon, who distinguished a recognition threshold from an awareness threshold, states that the threshold level is that point

⁴⁰Post, p. 76.

⁴¹Veeder, p. 28.

at which the subject decides that something is present.⁴² Hawkins found that most current research uses the recognition threshold as that point that the length of intensity of the exposure is correctly reported in the first time in a series of exposures of increasing duration or intensity.⁴³

Dunlap tested each of his subjects, individually, by placing either a circular or square shaped figure against the back of the screen to test the intensity of the light, and the intensity of the rear light was "reduced until the subject was unable to detect the shadows caused by the figure."⁴⁴ To replicate the Dunlap study Titchener and Pyle also used the circle and the square. "The intensity of the light at the back was slowly reduced, until the observer was just unable to detect the shadows cast by these figures."⁴⁵ Here Titchener and Pyle included those things above the threshold of awareness but below recognition to ensure that Dunlap's experiment had every

⁴²Dixon, pp. 188-190.

⁴³D. Hawkins, "The Effects of Subliminal Stimulation of Drive Level and Brand Preference," Journal of Marketing Research, 7, 1970, p. 332.

⁴⁴K. Dunlap, "The Effect of Imperceptible Shadows on Judgement of Distance," Psychological Review, 7, 1900, p. 437.

⁴⁵E. B. Titchener and W. H. Pyle, "The Effect of Imperceptible Shadows on the Judgment of Distance," Proceedings of the American Philosophical Society, 46, 1907, p.97.

chance of successful replication. Baker also varied the intensity of the light in steps with a rheostat. Subjects were made aware of the possibility of subliminal stimulation by being directed that their verbal behavior might be influenced by stimuli just above, just at, and just below the conscious threshold.⁴⁶ This initial testing defined each subjects threshold level at the point where the raising of intensities gave the subject the feeling of having the slightest confidence that the stimuli was either the vertical or diagonal line. George and Jennings also found threshold level, in this case for groups of subjects, "by varying illumination with the rheostat, the appropriate stimulus quality below a forced-choice detection threshold was established."⁴⁷ Veeder decided on the threshold level for projecting her images on films by similar means. Assistants in the viewing room indicated when image levels became visible by increasing the light level. The film was then projected over the slide image and the assistants noted where the image could be seen in the film. Levels were then altered to be sure that in all moments of the films they were not visible.

⁴⁶L. E. Baker, "The Influences of Subliminal Stimuli Upon Verbal Behavior," Journal of Experimental Psychology, 20, 1, 1937, p. 88.

⁴⁷S. G. George and L. Jennings, "Effect of Subliminal Stimuli on Consumer Behavior: Negative Evidence," Perceptual and Motor Skills, 41, 3, December, 1975, p. 849.

Once the light level was determined and marked on the dimmers, several film students, unaware of the subliminal stimulation saw the films and did not perceive anything out of the ordinary. The film students were then told of the added subliminal elements. They again viewed the films and reported no sightings of the added elements.⁴⁸

STUDIES UTILIZING LOW LIGHT INTENSITY TECHNIQUES

Dunlap, one of the earliest documented experimenters in low-intensity visual stimulation, found "the conscious effect of stimulation of such low intensity as to be imperceptible presents an attractive and almost unexploited field for experimental work."⁴⁹ This observation, due to the unanswered questions of such initial studies as Dunlap's, is even more valid today than when Dunlap made it in 1900. He asked subjects to make judgements of the length of lines, which by utilization of subliminal shadow, represented the Meuller-Lyer optical illusion. Dunlap hypothesized "if we have the segments of the principal line in the illusion-figure distinctly marked, but the angular lines of an intensity just below the threshold of perception, we have the simple materials for determining whether or not these imperceptible lines will produce in

⁴⁸Veeder, p. 30.

⁴⁹Dunlap, p. 435.

any degree the ordinary illusion-effect."⁵⁰ His study found that subliminal angular lines did influence subjects' judgements of the length of the lines.⁵¹

Bressler replicated the Dunlap study. He used a technique with grey paper on a grey background to form the angular lines. There was evidence of subliminal stimulation effecting subjects' perception of distance and there was a direct function of intensity and magnitude of response.⁵² Hollingworth documents a replication of the Dunlap study on which eighty-five percent of the subjects scored significantly above chance levels in judging the distances as influenced by the subliminal angular lines. It was concluded that subliminal perception had occurred.⁵³

Conversely, Titchener and Pyle replicated the Dunlap study with very different results. They utilized only the rear screen projection which was only partially employed by Dunlap. They also raised the threshold level to include an area where subjects felt they were possibly

⁵⁰Dunlap, p. 435.

⁵¹Dunlap, p. 453.

⁵²J. Bressler, "Illusion in the Case of Subliminal Visual Stimulation," Journal of General Psychology, 5, 2, 1931, pp. 244-251.

⁵³H. L. Hollingworth, Advertising and Selling, New York: Appleton, 1913, pp. 229-231.

aware of the subliminal stimuli. They warned earlier psychologists about the fallacy of being "dogmatic" about the existence of subliminal perception; daring these psychologists to come to grips with "a principle so revolutionary - for the whole environment is full of subliminal influences, which experimental psychologists have systematically neglected!"⁵⁴ Their three experiments concluded: 1. that imperceptible shadows, raised almost to the limit of perceptibility, exert no influence upon subjects judgements; 2. that shadows, so weak as to barely hold their form with distinction, exert an influence upon judgement comparable with the influence exerted by strong and clear shadows; and 3. that it is possible, by voluntary direction of attention to free judgement from the influences of the subliminals.⁵⁵ In short, Dunlap's results were found to be in error. Furthermore, Baker reports the experiment of Mangro and Washburn which "repeated Dunlap's experiment, using a slightly different technique from that of Dunlap and Titchener and Pyle, and interpreted their results as supporting Titchener and Pyle and failing to confirm Dunlap's findings."⁵⁶ Dixon defends the Dunlap studies finding the harshness of Titchener and

⁵⁴Titchener and Pyle, p. 95.

⁵⁵Titchener and Pyle, p. 104-105

⁵⁶Baker, p. 85.

Pyle studies to be due to their obvious "extreme incredulity"⁵⁷ and "irrationality" of their all or nothing stand against Dunlap.⁵⁸

Baker devised a test which included investigations of both visual and audio subliminal stimulation. Subjects, in the visual modality, were presented low light stimulation of either a vertical or a diagonal line. The subjects were required to utter a judgement of which line was being projected and an estimate in numbered code of how confident they were of their response. The intensity of the illumination was varied from trial to trial, some intervals including times of no stimulation giving Baker a statistical base to estimate error percentage.⁵⁹ Baker concluded that: 1. verbal behavior is influenced by stimuli below the conscious judgement threshold; 2. physiological thresholds are lower than thresholds of conscious judgement, and 3. the influence of subliminal stimuli is a function of the intensity of the subliminal stimuli.⁶⁰

Goldstein and Barthol completed two studies conducted to "determine the effect of incidental visual

⁵⁷Dixon, p. 39.

⁵⁸Dixon, p. 40.

⁵⁹Baker, p. 97.

⁶⁰Baker, p. 99.

stimulation (words) upon fantasy response."⁶¹ The incidental stimuli, projected at a one second rate for twenty exposures of each TAT slide, were projected adjacently to the conscious TAT slides. Hidden tape records recorded subjects' responses. Four of the TAT slides were utilized. The three groups used were formed according to the emotional tone of the incidental stimuli. These groups were positive, negative, and neutral. Also, a control group received incidental nonsense syllables. The first study showed no effect of the incidental stimuli. When the second study was conducted with "the ambiguity" of the TAT cards "increased by adjusting the lens on the TAT projector to maximum diffusion of the projected image."⁶² Evidence was found that the positive group produced the most positively toned stories; the negative, the most negatively toned stories; and the neutral group, the most "intermediate emotional tone."⁶³

George and Jennings presented the words "Hershey's Chocolate" via a slide projector, governed by a rheostat, as a portion of a regularly scheduled lecture in which forty slides were shown. A student assistant, in the

⁶¹M. J. Goldstein and R. P. Barthol, "Fantasy Responses to Subliminal Stimuli," Journal of Abnormal and Social Psychology, 60, 1, 1960, p. 25.

⁶²Goldstein and Barthol, p. 24.

⁶³Goldstein and Barthol, p. 26.

guise of testing equipment, superimposed the message over the slides. The study was done to "correct methodological weaknesses found in previous experiments designed to test the contentions of motivational research theorists that subliminal stimulation can affect buying behavior."⁶⁴ In a buying situation, no support was found for the claims of motivational research as to the effects of such a subliminal message upon subjects.

Hart exposed a group to a subliminal stimulus consisting of a 35-mm color slide of a whisky bottle with a glass partially filled with liquor and the word "poison" printed in capital black letters on top of the bottle. An alcoholism questionnaire was given and indicated that programmed exposure of a noxious subliminal stimulus significantly modified attitudes toward alcoholism. Findings suggest that stimuli which are not consciously perceived can influence attitudes.⁶⁵

Somekh and Wilding presented a neutral face paired with subliminal affect words. The subjects were asked to rate its expression using a forced choice indicator. Words presented outside of awareness had an affect on semantically related judgements which was at least as

⁶⁴George and Jennings, p. 847.

⁶⁵L. Hart, "The Effect of Noxious Subliminal Stimuli On the Modification of Attitudes Toward Alcoholism: A Pilot Study," British Journal of Addiction, 68, 2, June, 1973, pp. 87-90.

great as that with the same words presented supraliminally. In a second experiment, this was confirmed and it was found that increasing the similarity of contour between critical and control words of different meanings suggested differences between subliminal and supraliminal sessions. It is suggested that the experiments have relevance to current theories of selective attention.⁶⁶

Of particular interest to this review of literature was the study conducted by Veeder. She utilized both words and symbols of death and sex applications to test subliminal influences of audiences' response to characters and plots of two movies. Rheostatically controlled low-light projection was used over the screening of the movies. It was found that there were statistically significant differences to the response to one of the characters. Also, the more loosely structured semi-abstract film proved to evoke significantly different responses. This parallels the findings of Goldstein and Barthol who found more influence of subliminals on vague and defined characters. There was evidence, in accordance with Klein, Spence, and Gourevitch that subliminal pictures of sexual genitalia affected audience responses to the respective femininity or masculinity of the characters. In discussing the

⁶⁶D. E. Somekh and J. M. Wilding, "Perception Without Awareness in a Dichoptic Viewing Situation," British Journal of Psychology, 64, 3, August, 1973, pp. 339-349.

failure of Steiner and Post to achieve any significant results Veeder matches her study evidence that "the fact that there are significant results to discuss tends to support the theory that low-light projection is a better method for producing subliminal suggestion in a film than the tachistoscope."⁶⁷ No differences were found in plot interpretations of the two movies due to the stimulation or in the comparing of subliminal pictures to words at subliminal levels. Also, it was observed that a blank screen was preferable to a screen which presented a movie for the projection of rheostatically controlled subliminals.

SUMMARY OF LITERATURE

No evidence was found of experimentation of subliminal stimulation and affective learning tasks or the classroom environment. Experiments, however, were documented which did have evidence of emotional effects of subliminal stimulation of the possible theories in dispute to decipher the phenomenon of subliminal perception. The theory of perceptual defense was found to be the most respected. The perceptual defense theory found subliminal stimulations to be recorded by the unconscious of the perceiver and affect consequent behavior because

⁶⁷Veeder, p. 49.

these stimulations were threatening in nature. Drive-related subliminal messages, particularly those threatening the perceivers with implied sex or death and aggression themes, were the most utilized and were those showing the most affective behavioral changes in subjects. The phenomenon of the associative effect of subject's response was revealed as was the lingering influence, or Poetzl effect, of such drive-related stimulation. Generally, it was found that the lower the intensity of the subliminal visual image, the greater the subliminal effect, but the lower the identification or recognition level. Low-light studies were reviewed, finding the area very sparsely developed. A generalized model for finding a threshold level was synthesized.

Chapter Three

RESEARCH DESIGN

INTRODUCTION

The purpose of this chapter is to present the research methodology of this study. It is intended (1) to identify dependent and independent variables, (2) to discuss the nature and administration of the instrument, (3) to discuss the nature and administration of the stimuli, and (4) to present statistical techniques employed in the analysis of the data. The discussion of the research design follows this fourfold division of the content of the chapter.

SELECTION OF THE VARIABLES

In accordance with the purpose of the study and drawing on the preceding review of the literature, the independent variable identified as influential in affecting attitudes toward a learning task was the message that was being subliminally presented. Therefore the content of the subliminally projected stimuli were varied with each group. The content of these messages differed as follows: (A) the control group (1) was presented no

subliminal stimuli, (B) group 2 received a neutral, non-drive related stimulus, (C) group 3 received a drive-related "death" stimulus, and (D) group 4 received a drive-related "sex" stimulus.

Each of the experimental groups (2, 3, 4) were tested in the same learning environment. Strict controls were maintained in keeping the duration of time and level of intensity of the stimulus constant. In each instance the stimulus was projected for thirty minutes at a constant level of 39.5 footcandles.

Selected also on the basis of previous research, the dependent variable was the subjects' attitude toward a learning task. These attitudes were reflected in responses given to statements on the instrument which consisted of selecting an attitudinal response on a five-point Likert-type scale. The delineation of this dependent variable is presented in the following section on the nature and administration of the instrument.

THE NATURE AND ADMINISTRATION OF THE INSTRUMENT

The testing and measuring of attitudes in this study were achieved by the construction and utilization of a specially produced Likert-type summated rating scale. This instrument was produced within particular applications prescribed by Krathwohl's The Affective Domain Taxonomy

and his criteria for the developing of a testing instrument for the first three steps of a learner's receiving affective stimuli.

A Likert-type scale was chosen as the best available method of finding out each students particular attitudes. Geisert documents the effectiveness of the Likert-type scale as "having validity for reported attitudes, although reported attitudes have not been shown to be valid measures of other behaviors."¹ Maranell speaks of the consistency, variability, frequency of use, and popularity of the Likert-type scales in attitudinal measurement. He further documents its "reliability of coefficients that compare very favorably with those of other scales."²

A self-testing device such as the Likert scale takes into account the necessity of an instrument which will allow each subject to reveal his own individual attitude. Only such a self-reporting device could bring to light the necessary insights involved in the study of the affective domain. Krathwohl notes the researchers' need to remain sensitive to the fact that even at the

¹P. Geisert, The Dimensions of Measurement of the Affective Domain, U. S., Educational Resources Information Center, ERIC Document ED 069 663, 1972, pp. 14-15.

²G. Maranell, Scaling: A Sourcebook for Behavioral Scientists (Chicago: Aldine Publishing Company, 1974), pp. 231-232.

bottom rung of receiving, simple conscious or semi-conscious awareness, each subject is already armed with previous experiences that are unique to that particular subject. "Because of previous experiences (formal and informal), the student brings to each situation a point of view or set which may facilitate or hinder his recognition of that which the teacher is trying to sensitize him."³ Thus, a summated rating scale, following the Likert formula, allowed a continuum of choices to give each subject his own necessary variety of responses to reflect his own unique attitudinal positions. The selection of statements for a Likert-type scale is documented by Rensis Likert.⁴ Each question is an expression of "desired behavior" and not statements of cognitive fact. Thus, learners with different attitudes will give differing responses without becoming hung-up in agreeing on stated facts. It must be noted, however, that the first two steps of Krathwohl's Taxonomy are almost inseparable from simple cognitive recognition, due to the rudimentary nature of simple recognition. Hence, the first two levels of the question, to some small extent, will deal with cognitive sensitization

³Krathwohl, et al., p. 98.

⁴Rensis Likert, "The Method of Constructing an Attitude Scale," Scaling: A Sourcebook for Behavioral Scientists, ed. G. M. Maranell (Chicago: Aldine Publishing Company, 1974), pp. 223-243.

of the learner. Likert's second criteria for the selection of test statements is the "necessity of stating each proposition in clear, concise, straight-forward statements." Thirdly, reactions should be worded so that "modal reaction to it is approximately in the middle of possible responses." Likert suggests that the continuum be constructed with half the responses being on one end of the spectrum and the opposite or differing half on the other. In any case "only a single attitude variable" should be included in each statement.

Gorden finds comfort in the fact that in the Likert-type scale the respondent has to "respond to all items on a five-point scale of intensity," rather than merely selecting one alternative.

After the subjects had responded to the whole list of statements, the method of internal consistency was used to select the items belonging on the one relevant dimension. This was done by correlating the value of the response of one question with the mean value of all the items of that person. This process is repeated for all items in the original set; then those items which have a low correlation are eliminated from the scale. After those items are eliminated, all the tests must be rescored, using only those which correlate highly with the total score on the test.⁵

⁵R. L. Gorden, Unidimensional Scaling of Social Variables: Concepts and Procedures (New York: The Free Press, 1977), pp. 38-39.

The three levels of questioning derived from the receiving level of the Taxonomy are : 1. awareness, 2. willingness to learn, and 3. selective attention.

1. Awareness. The first level of the receiving of attitudinal information is the simple sensitization of the learner to "the existence of certain phenomena and stimuli; that is, that he be willing to receive or to attend to them."⁶ On this primal level questions must reveal the openness of the learner to being made aware in either simple consciousness or semi-consciousness. On one end of the continuum lies "from an extremely passive position or role on the part of the learner, where the sole responsibility for the evocation of the behavior rests with the teacher--that is, the responsibility rests with him for 'capturing' the student's attention--the continuum extends to a point at which the learner directs his attention, at least at a semiconscious level, toward the preferred stimuli."⁷ Krathwohl warns the researcher that "there can be simple awareness without specific discrimination or recognition of the objective characteristics of the object, even though these characteristics of the object must be deemed to have an effect."⁸ The main point of the instrument being to

⁶Krathwohl, et al., p. 98.

⁷Krathwohl, et al., p. 99.

⁸Krathwohl, et al., p. 99.

test awareness, "whether the student is conscious of something; whether he is aware of the existence of some person, phenomenon, event, or state of affairs."⁹

Krathwohl notes that an instrument to test must be constructed in light of a "range of awareness can occur along a continuum from very unsophisticated or gross awareness to highly sophisticated and detailed awareness."¹⁰ Thus, "the major problem in testing awareness is to devise test situations which allow awareness to emerge without any direct hint from the examiner that the object or phenomenon exists."¹¹

2. Willingness to Learn. The subject now must be "willing to tolerate a given stimulus, not avoid it."¹²

At this level of the continuum the teacher is not concerned that the student seek it out, nor even, perhaps that in an environment crowded with many other stimuli the learner will necessarily attend to the stimulus. Rather at worst, given the opportunity to attend in a field with relatively few competing stimuli, the learner is not actively seeking to avoid it. At best, he is willing to take notice of the phenomenon and give it his best attention.¹³

Here Likert questioning must include only those words which do not imply a positive feeling toward a

⁹Krathwohl, et al., p. 101.

¹⁰Krathwohl, et al., p. 101.

¹¹Krathwohl, et al., p. 101.

¹²Krathwohl, et al., p. 107.

¹³Krathwohl, et al., p. 107.

learning task. "Some of the terms in objectives which are likely to be classified in this category are: amendable to, disposed toward, inclined toward, tractable with respect to, etc."¹⁴ To test the willingness to receive one must remain negative so as to "determine whether there is an absence of a rejection of the stimulus."

Krathwohl outlines a Likert-type scale in these terms:

The three alternative Like-Indifferent-Dislike response model is the one most commonly used. Five response alternatives are employed in some instruments, but this is the exception rather than the rule. The two alternatives added represent very strong dispositions, one toward the stimulus and the other away from it.¹⁵

Krathwohl continues by praising alternatives such as "possibly", "uncertain", "indifferent", or "interesting" which "contain neutral or tentatively positive" values.¹⁶ The continuum effect, or a Likert spectrum of choices is again in effect and represented.

3. Controlled or Selected Attention. "At a somewhat higher level one is concerned with a new phenomenon, the differentiation of a given stimulus into figure and ground at a consciousness level--the differentiation of aspects of a stimulus which is prescribed as clearly

¹⁴Krathwohl, et al., p. 107.

¹⁵Krathwohl, et al., p. 108.

¹⁶Krathwohl, et al., p. 109.

marked off from adjacent impressions."¹⁷

Now the student is intently aware of the stimuli. Here the Likert scale takes on the guise of "the interest inventory model."¹⁸ "In general, the activities and questions remain the same, but the response alternatives keyed for controlled or selected attention are constructed in order to reflect the greater amount of attention to the stimulus."¹⁹ Here stronger wording such as "I have a strong desire to learn about," or "this matter intrigues me," are used. Also synthesized should be the forced-choice method whereby "the examiner chooses a variety of different activities or tasks and presents them to the student" forcing a choice of the student's preference.²⁰

The questionnaire conformed to the stated criteria for construction. Once the appropriate stimulus had been administered for a thirty minute period, the stimulus was removed and the questionnaire administered with the following instructions:

You will be shown six slides. After each slide, would you please choose the statement which most closely matches your feelings about that slide.

¹⁷Krathwohl, et al., p. 112.

¹⁸Krathwohl, et al., p. 113.

¹⁹Krathwohl, et al., p. 113.

²⁰Krathwohl, et al., p. 114.

There are three statements for each slide and five choices for each statement. There are no "right" or "wrong" choices. Do not puzzle or ponder over a response as we are interested only in your initial reaction. Please do not talk during this short period of testing. Your name is not to be placed on the response sheet and this test will in no way affect your grade in this course or in any other.

The time allowed for the completion of the questionnaire was three and one-half minutes, allowing 45 seconds for the completion of each set of statements relating to each slide.

THE NATURE AND ADMINISTRATION OF THE STIMULI

Each of the four groups was presented a Likert-type questionnaire consisting of three statements relating to each of six slides. Each of the three statements allowed the subject to choose a response from a list of five responses. The five responses were designed to reflect both a positive and a negative motivational level from which to choose. Choices A and B on the scale represent a scaled positive motivation, choice C a neutral motivation, and choice D and E represented a scaled negative motivation. Each of the four groups were presented the same slides. Slide number 1 was a super-realistic sculpture of a man setting in a chair; Slide 2 was a picture of the Dalai Lama; Slide 3 was a super-realistic painting of a mustachioed anonymous male; Slide 4 was a photograph of Mata

Hari; Slide 5 was a super-realistic painting of an anonymous female; and Slide 6 was a photograph of Rasputin.

Group 1

This control group consisted of 33 persons who were presented the posttest only.

Group 2

Group 2 consisted of 33 subjects and received a stimulus that was determined to be neutral. This was in fact Slide 2 in the posttest with the name "Dalai Lama" written on the bottom of the slide, and transmitted via a rheostatically controlled slide projector by means of rear screen projection. (See appendix.)

Group 3

This group consisted of 28 subjects and was presented a drive-related stimulus. This stimulus was also presented subliminally under the same conditions as group 2 and 4 and reflected a death motif. This was Slide 2 used in the posttest, altered to reflect a death image. The name "Dalai Lama" was written on the bottom of the slide. (See appendix.)

Group 4

Group 4 consisted of 29 subjects and received a stimulus that was drive-related. This stimulus was also presented subliminally under the same conditions as groups

2 and 3. This too was Slide 2 used in the posttest but was altered to reflect a sex image and had the written "Dalai Lama" on the bottom of the slide. (See appendix.)

PRESENTATION OF THE STIMULUS

None of the groups were aware of the presentation of the stimuli. The Hawthorne effect was negated in that the subjects were attending regularly scheduled classes in which room changes were explained as due to the need for movie preview equipment for a regularly scheduled in class film showing or the scheduling of a speaker for the class. Hence, subjects were attending regularly scheduled classes without suspicion of unusual circumstances other than those of a regular classroom environment. Subjects were not consciously aware of experimental stimulation. The visual subliminals were presented via a rheostatically controlled 2 X 2 slide projector onto a rear screen. This environment was the same with each group. The ambient light level was determined to be 39 footcandles by the use of the Gossen Panlux Electronic Footcandle Meter, a highly sensitive instrument. The stimulus was presented at 39.5 footcandles of intensity for a period of 30 minutes. Thus, the image level of the screen was .5 footcandles greater than the ambient level of the screen. This threshold level was selected by individual experimentation upon subjects unrelated to the study and was based upon a review of the

literature. Beginning at a clearly visible level, the stimulus was dimmed at one half footcandle gradations until all subjects could no longer perceive the phenomenon (39 footcandles). The footcandle level was then raised one half footcandle to 39.5 footcandles. During the course of the study no subject made any reference to the existence of any irregularity. Considering this covers three stimulation periods of 30 minutes of classroom activities time (90 minutes) where subjects are free to verbalize opinions and feelings, the researcher is certain that the stimulation was not consciously perceived by subjects. This threshold setting is in keeping with the techniques found in the literature and validated by Key.

Chapter Four

RESULTS AND ANALYSES

INTRODUCTION

The major purpose of this study was to determine if the receiving level of the affective domain of learners could be affected by the presentation of rheostatically controlled visual subliminals. The correlation between results observed of the effects of rheostatically controlled visual subliminals toward a specific learning task and other learning tasks was tested.

Groups

There were four groups. Group 1 was a control group, Group 2 received a neutral stimulus, while Group 3 received a drive-related (death) stimulus, and Group 4 received a drive-related (sex) stimulus. Each of the experimental groups received a stimulus at a level just below the threshold of conscious awareness for a period of 30 minutes at which time a posttest was administered.

Stimuli

Neutral stimulus. Group 2 received the neutral stimulus. This consisted of a slide of the Dalai Lama

projected via a Kodak Carousel 2 X 2 slide projector onto a rear screen located at the front of the classroom. This image was projected at a light level just below the awareness threshold level of the subjects. Across the bottom of the slide were the words "Dalai Lama" (See appendix.)

Drive-related (Death). Group 3 received the drive-related (death) stimulus. This consisted of a slide of the Dalai Lama projected via a Kodak Carousel 2 X 2 slide projector onto a rear screen located at the front of the classroom. This image was projected at a light level just below the awareness threshold level of the subjects. Across the bottom of the slide were the words "Dalai Lama" and the slide also had the words "dead" and "death" written several times across it. Also, a dagger was stuck in the forehead of the Dalai Lama, and a snake was coiled and ready to strike. A skull and crossbones was also placed on the slide (See appendix.)

Drive-related (Sex). Group 4 received the drive-related (sex) stimulus. This consisted of a slide of the Dalai Lama projected via a Kodak Carousel 2 X 2 slide projector onto a rear screen located at the front of the classroom. This image was projected at a light level just below the awareness threshold level of the subjects. Across the bottom of the slide were the words "Dalai Lama" and the slide also had the word "sex" written several times

across it. Also, a male torso with an erect penis and a female torso were added to the slide (See appendix.)

Posttest

The posttest consisted of a Likert-type questionnaire and six slides.

The questionnaire. The Likert-type questionnaire consisted of three questions corresponding to each of six slides. Then three questions corresponded to Krathwohl's three levels within the receiving level of the affective domain. Each of these questions had five responses from which the subject was asked to choose the one most closely akin his feelings about the slide (See appendix.)

The slides. The slides were presented one at a time over a 35 second interval. Slide 1 was a long shot of a super-realistic sculpture of a man sitting on a chair and was shown for a period of 20 seconds. The screen was then darkened and the subject was asked to answer the corresponding question on the questionnaire. Slide 2 was a medium shot of the Dalai Lama, Slide 3 was a close up of a super-realistic painting of a man, Slide 4 was a long shot of Mata Hari, Slide 5 was a chose up of a super-realistic painting of a woman.

Scoring. The questionnaire was scored in the following fashion: Each question had five choices from

which to choose one most closely akin to the subjects feelings about the corresponding slide. The five choices corresponded to positions on the following scale:

2	1	0	1	2
A	B	C	D	E

So, choice A was assigned a value of 2 points, as was choice E. Choice B was assigned a value of 1 point, as was choice D. Choice C was neutral in value and corresponded to a neutral position (See appendix.). Choice A and E are of equal value in that they each represent the highest level of motivation. This motivation can either be positive (A) or negative (E) and still represent equally strong motivational levels. Choices B and D corresponded in motivational level. Choice C is a neutral motivational level.

RESULTS AND ANALYSES OF THE POSTTEST

After the appropriate treatment, each subject within each group was administered the same posttest. Table 1 page 62 presents a summary of the raw data scores, the N, and the mean of the control group (1) and experimental group (2). An analysis of variance and a t-test were used to compare the results of the groups on the posttest. The .05 level was chosen to represent a significant difference.

Table 1

Summary of Raw Data Scores of the Control Group (1) and
Experimental Group (2) on the Posttest

Raw Score		2	1	0		
		Distribution of Scores			N	Mean
Slide 1	Question 1 (1)	24	4	5	33	1.60
	Question 1 (2)	22	5	6	33	1.43
	Question 2 (1)	5	15	13	33	.80
	Question 2 (2)	10	13	10	33	.97
	Question 3 (1)	4	14	15	33	.63
	Question 3 (2)	1	16	16	33	.57
Slide 2	Question 1 (1)	8	18	7	33	1.03
	Question 1 (2)	9	14	10	33	.97
	Question 2 (1)	6	15	12	33	.80
	Question 2 (2)	6	13	14	33	.77
	Question 3 (1)	4	20	9	33	.86
	Question 3 (2)	6	16	11	33	.83

Table 1 (continued)

Raw Score		2	1	0		
Distribution of Scores					N	Mean
Slide 3	Question 1 (1)	26	3	4	33	1.69
	Question 1 (2)	26	5	2	33	1.70
	Question 2 (1)	7	9	17	33	.74
	Question 2 (2)	8	16	9	33	.97
	Question 3 (1)	6	13	14	33	.80
	Question 3 (2)	8	15	10	33	.93
Slide 4	Question 1 (1)	7	18	8	33	1.03
	Question 1 (2)	14	11	8	33	1.13
	Question 2 (1)	4	11	18	33	.69
	Question 2 (2)	5	16	12	33	.70
	Question 3 (1)	3	12	18	33	.66
	Question 4 (2)	5	9	19	33	.47

Table 1 (continued)

Raw Score		2	1	0		
Distribution of Scores					N	Mean
Slide 5	Question 1 (1)	24	5	4	33	1.63
	Question 1 (2)	28	3	2	33	1.77
	Question 2 (1)	8	9	16	33	.71
	Question 2 (2)	3	17	13	33	.77
	Question 3 (1)	3	13	17	33	.54
	Question 3 (2)	3	17	13	33	.77
Slide 6	Question 1 (1)	16	10	7	33	1.31
	Question 1 (2)	19	10	4	33	1.43
	Question 2 (1)	9	12	12	33	.91
	Question 2 (2)	8	15	10	33	.97
	Question 3 (1)	9	15	9	33	.97
	Question 3 (2)	8	16	9	33	1.70

CONSIDERATION OF HYPOTHESES I THROUGH III

Following the treatment a posttest was administered to ascertain the results of the treatment. The results of the posttest were analyzed and used as a basis for consideration of Hypotheses I through III. (See Table 1, page 62, for a summary of the data from the posttest, and Table 4, page 67, for the results of the t computation.)

Hypothesis I

Hypothesis I stated that there would be no significant difference between the control group (1) and the neutral stimulus group (2) for knowledge of the existence of the learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin to his own feelings. The control group had a mean score of 1.03, while the mean score of the experimental group was .97. These mean scores compared using a t-test at a significance level of .05. This analysis yielded a result of .74 which was not equal to or greater than that needed for significance at the .05 level. Hypothesis I was not rejected as the difference between the mean scores for the two groups was not significant.

Hypothesis II

Hypothesis II stated that there would be no significant difference between the control group (1) and the neutral stimulus group (2) for the willingness to receive a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The control group had a mean score of .80, while the mean score of the experimental group was .77. These mean scores were compared using a t-test at a significance level of .05. This analysis yielded a result of .76 which was not equal to or greater than that needed for significance at the .05 level. Hypothesis II was not rejected as the difference between the mean scores for the two groups was not significant.

Hypothesis III

Hypothesis III stated that there would be no significant difference between the control group (1) and the neutral stimulus group (2) for the submission of controlled attention to a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The control group had a mean score of .86, while

the mean score of the experimental group was .83.

A comparison of the mean score of the control group, .86, and the mean score for the experimental group, .83, yielded a t-score at the .97 level.

This t-score was not greater than or equal to that needed for significance at the .05 level. Therefore, the hypothesis stating no significant difference between the two groups failed to be rejected.

Table 4

Comparisons of the Mean Scores of the Experimental
Control Group (1) and the Experimental
Neutral Stimulus Group (2) on
the Posttest

	Group	N	Mean	<u>t</u> -score
Level 1	Control (1)	33	1.03	.34
	Neutral Stimulus (2)	33	.97	
Level 2	Control (1)	33	.80	.30
	Neutral Stimulus (2)	33	.77	
Level 3	Control (1)	33	.86	.03
	Neutral Stimulus (2)	33	.83	

t (.05) equals 2.02

Table 2, page 68, presents a summary of the raw data scores, the N, and the mean of the control group (1) and the drive-related (death) experimental group (3). An analysis of variance and a t-test were used to compare the

Table 2

Summary of Raw Data Scores of the Control Group (1) and
the Experimental Group (3) on the Posttest

Raw Score		2	1	0		
		Distribution of Scores			N	Mean
Slide 1	Question 1 (1)	24	4	5	33	1.60
	Question 1 (3)	16	9	3	28	1.46
	Question 2 (1)	5	15	13	33	.80
	Question 2 (3)	4	16	8	28	.86
	Question 3 (1)	4	14	15	33	.63
	Question 3 (3)	2	17	9	28	.75
Slide 2	Question 1 (1)	8	18	7	33	1.03
	Question 1 (3)	5	17	6	28	.96
	Question 2 (1)	6	15	12	33	.80
	Question 2 (3)	4	12	12	28	.71
	Question 3 (1)	4	20	9	33	.86
	Question 3 (3)	3	16	9	28	.79

Table 2 (continued)

Raw Score		2	1	0		
		Distribution of Scores			N	Mean
Slide 3	Question 1 (1)	26	3	4	33	1.69
	Question 1 (3)	15	10	3	28	1.43
	Question 2 (1)	7	9	17	33	.74
	Question 2 (3)	5	11	12	28	.79
	Question 3 (1)	6	13	14	33	.80
	Question 3 (3)	2	8	18	28	.43
Slide 4	Question 1 (1)	7	18	8	33	1.03
	Question 1 (3)	14	11	3	28	1.39
	Question 2 (1)	4	11	18	33	.69
	Question 2 (3)	5	17	6	28	.96
	Question 3 (1)	3	12	18	33	.66
	Question 3 (3)	6	14	8	28	.93

Table 2 (continued)

Raw Score		2	1	0		
		Distribution of Scores			N	Mean
Slide 5	Question 1 (1)	24	5	4	33	1.63
	Question 1 (3)	19	8	1	28	1.64
	Question 2 (1)	8	9	16	33	.71
	Question 2 (3)	3	18	7	28	.86
	Question 3 (1)	3	13	17	33	.54
	Question 3 (3)	1	14	13	28	.57
Slide 6	Question 1 (1)	16	10	7	33	1.31
	Question 1 (3)	15	8	5	28	1.43
	Question 2 (1)	9	12	12	33	.91
	Question 2 (3)	4	18	6	28	.93
	Question 3 (1)	9	15	9	33	.97
	Question 3 (3)	10	11	7	28	1.11

results of the group on the posttest. The .05 level was chosen to represent a significant difference.

CONSIDERATION OF HYPOTHESES IV THROUGH VI

Following the treatment, a posttest was administered to ascertain the results of the treatment. The results of the posttest were analyzed and used as a basis for consideration of Hypotheses IV through VI. (See Table 2, page 68, for a summary of the data from the posttest, and Table 5, page 73, for the results of the t computations.)

Hypothesis IV

Hypothesis IV stated that there would be no significant difference between the control group (1) and the drive-related (death) group (3) for the knowledge of the existence of a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The mean score for the control group was 1.03, while the mean score for the drive-related (death) group was .96.

A t-test was used to compare the mean scores and yielded a t-score of .38, which was not significant at the .05 level. The use of a drive-related (death) stimulus

did not result in significantly higher posttest scores requiring the knowledge of the existence of a learning task. Therefore, Hypothesis IV was not rejected.

Hypothesis V

Hypothesis V stated that there would be no significant difference between the control group (1) and the drive-related (death) group (3) for the willingness to receive a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The control group had a mean score of .80, while the mean score of the experimental group was .71.

The difference in these mean scores was .09, which, upon analysis, yielded a t-score of .52. This t-score was less than the 2.01 required for significance at the .05 level. Therefore, the hypothesis that no significant difference would exist in the posttest scores of the willingness to receive a learning task was not rejected.

Hypothesis VI

Hypothesis VI stated that there would be no significant difference between the control group (1) and the

drive-related (death) group (3) for the submission of controlled attention to a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The control group had a mean score of .86, while the mean score of the experimental group was .79.

The analysis of the minor difference of .07 in mean scores yielded a t -score of .35, which was not equal to or greater than the 2.01 required for significance at the .05 level. Therefore, the hypothesis that no significant difference would exist in the scores on the submission of controlled attention to a learning task was not rejected.

Table 5

Comparisons of the Mean Scores of the Control Group (1) and the Experimental Drive-Related (Death) Group (3) on the Posttest

	Group	N	Mean	t -score
Level 1	Control (1)	33	1.03	.70
	Experimental (3)	28	.96	
Level 2	Control (1)	33	.80	.60
	Experimental (3)	28	.71	
Level 3	Control (1)	33	.86	.35
	Experimental (3)	28	.79	

t (.05) equals 2.01

CONSIDERATION OF HYPOTHESES VII THROUGH IX

Following the treatment, a posttest was administered to ascertain the results of the treatment. The results of the posttest were analyzed and used as a basis for consideration of Hypotheses VII through IX. (See Table 3, page 75, for a summary of data from the posttest, and Table 6, page 79, for the results of the t computations.)

Hypothesis VII

Hypothesis VII stated that there would be no significant difference between the control group (1) and the drive-related (sex) group (4) for knowledge of the existence of a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings.

A comparison of the mean score for the control group, 1.03 and the mean score for the experimental group (drive-related, sex) 1.07, yielded a t-score of .21. This t-score was not greater than or equal to the 2.01 required for significance. Therefore, the hypothesis of no significant difference between the posttest scores failed to be rejected.

Table 3

Summary of Raw Data Scores of the Control Group (1)
and Experimental Group (4) on the Posttest

Raw Score		2	1	0		
		Distribution of Scores			N	Mean
Slide 1	Question 1 (1)	24	4	5	33	1.60
	Question 1 (4)	17	9	4	30	1.50
	Question 2 (1)	5	15	13	33	.80
	Question 2 (4)	9	16	5	30	1.13
	Question 3 (1)	4	14	15	33	.63
	Question 3 (4)	5	19	6	30	.97
Slide 2	Question 1 (1)	8	18	7	33	1.03
	Question 1 (4)	7	18	5	30	1.07
	Question 2 (1)	6	15	12	33	.80
	Question 2 (4)	12	8	10	30	1.07
	Question 3 (1)	4	20	9	33	.86
	Question 3 (4)	10	16	5	30	1.20

Table 3 (continued)

Raw Score		2	1	0		
Distribution of Scores					N	Mean
Slide 3	Question 1 (1)	26	3	4	33	1.69
	Question 1 (4)	19	8	3	30	1.53
	Question 2 (1)	7	9	17	33	.74
	Question 2 (4)	8	11	11	30	.80
	Question 3 (1)	6	13	14	33	.80
	Question 3 (4)	7	11	12	30	.83
Slide 4	Question 1 (1)	7	18	8	33	1.03
	Question 1 (4)	11	15	4	30	1.23
	Question 2 (1)	4	11	18	33	.69
	Question 2 (4)	6	12	12	30	.80
	Question 3 (1)	3	12	18	33	.66
	Question 3 (4)	6	14	10	30	.87

Table 3 (continued)

Raw Score		2	1	0		
Distribution of Scores					N	Mean
Slide 5	Question 1 (1)	24	5	4	33	1.63
	Question 1 (4)	21	8	1	30	1.67
	Question 2 (1)	8	9	16	33	.71
	Question 2 (4)	5	11	14	30	.70
	Question 3 (1)	3	13	17	33	.54
	Question 3 (4)	2	13	15	30	.57
Slide 6	Question 1 (1)	16	10	7	33	1.31
	Question 1 (4)	20	8	2	30	1.60
	Question 2 (1)	9	12	12	33	.91
	Question 2 (4)	11	16	3	30	1.27
	Question 3 (1)	9	15	9	33	.97
	Question 3 (4)	10	15	5	30	1.17

Hypothesis VIII

Hypothesis VIII stated that there would be no significant difference between the control group (1) and the drive-related (sex) group (4) for the willingness to receive a learning task. The learning task consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The mean score on this level of the posttest for the control group was .80. The mean for the experimental group was 1.07.

The difference in mean scores was .27 which yielded a t-score of 1.24. This t-score was significant at the .21 level, far above the .05 level for significance. Therefore, Hypothesis VIII was not rejected.

Hypothesis IX

Hypothesis IX stated that there would be no significant difference between the control group (1) and the drive-related (sex) group (4) for the submission of controlled attention to a learning task. The learning task was the same as for all other groups and consisted of a study of the Dalai Lama. The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings.

The mean score for the control group was .86,

while the mean score for the experimental group was 1.20. A t-test was used to compare the mean scores and yielded a t-score of 2.17, which was significant to the .03 level. Therefore, Hypothesis IX was rejected.

Table 6

Comparisons of the Mean Score of the Control Group (1) and the Experimental Drive-Related (Sex) Group (4) on the Posttest

	Group	N	Mean	<u>t</u> -score
Level 1	Control (1)	33	1.03	.21
	Experimental (4)	30	1.07	
Level 2	Control (1)	33	.80	1.24
	Experimental (4)	30	1.07	
Level 3	Control (1)	33	.86	2.17*
	Experimental (4)	30	1.20	

t (.05) equals 2.01

*Significant at the .05 level

Table 7

Correlation Between Choice on Test Slide No. 2 and Slides 1, 3, 4, 5, and 6 Within Control Group (1)

Slide	Level	Pearson r		
		Low	Moderate	High
1	1		.47	
	2	.03		
	3	.14		
3	1		.39	

Table 7 (continued)

Slide	Level	Pearson r		
		Low	Moderate	High
4	2	.10		
	3		.29	
	1	.23		
	2	.09		
5	3	.21		
	1		.36	
	2	.19		
6	3		.32	
	1	.19		
	2		.71	
	3		.54	

-1.00 to - .75 High correlation
 - .74 to - .25 Moderate correlation
 - .24 to + .24 Low correlation
 + .25 to + .74 Moderate correlation
 + .75 to +1.00 High correlation

Hypothesis X

Hypothesis X stated that there would be no statistically significant correlation between learner attitude subliminally prescribed and learning tasks not subliminally prescribed. The learning task subliminally prescribed consisted of a study of the Dalai Lama. The learning tasks not subliminally prescribed consisted of: (1) a photograph of a super-realistic sculpture of a man sitting on a chair; (2) a close-up of a super-realistic painting of a man, (3) a long-shot of Mata Hari; (4) a close-up of a super-realistic painting of a woman; and, (5) a long-shot of Rasputin.

The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The data were gathered and the correlation between choice on the subliminally prescribed learning task and the learning task not subliminally prescribed within each group was computed using the Pearson Product-Moment, r . The statistically significant level was not at .75 or above, or -.75 level or below. Since none of the correlations were higher than .71, this null hypothesis failed to be rejected.

Table 8

Correlation Between Choice on Test Slide No. 2
and Choice on Slides 1, 3, 4, 5, and 6
Within Neutral Stimulus
Experimental Group (2)

Slide	Level	Low	Pearson r Moderate	High
1	1	.24		
	2	.10		
	3		.26	
3	1		.27	
	2	.12		
	3	.02		
4	1	.23		
	2	.15		
	3	.02		
5	1	.06	.41	
	2		.38	
	3		.34	
6	1			
	2	.11		
	3	.07		

-1.00 to - .75 High correlation
 - .74 to - .25 Moderate correlation
 - .24 to + .24 Low correlation
 + .25 to + .74 Moderate correlation
 + .75 to +1.00 High correlation

Table 9

Correlation Between Choice on Test Slide No. 2
and Choice on Slides 1, 3, 4, 5, and 6
Within Drive-Related (Death)
Experimental Group (3)

Slide	Level	Low	Pearson r Moderate	High
1	1	-.13	.45	
	2	-.09		
	3			
3	1	.20	.42	
	2			
	3			
4	1	.03		
	2	.22		
	3	-.18		
5	1	-.04		
	2	.16		
	3	.15		
6	1	.03	.35	
	2	-.05		
	3			

-1.00 to - .75 High correlation
 - .74 to - .25 Moderate correlation
 - .24 to + .24 Low correlation
 + .25 to + .74 Moderate correlation
 + .75 to +1.00 High correlation

Table 10

Correlation Between Choice on Test Slide No. 2
and Choice on Slide 1, 3, 4, 5, and 6
Within Drive-Related (Sex)
Experimental Group (4)

Slide	Level	Low	Pearson r Moderate	High
1	1	-.08	.31	
	2	.10		
	3			

Table 10 (continued)

Slide	Level	Pearson r		
		Low	Moderate	High
3	1		.31	
	2	.21		
	3	.07		
4	1	.04		
	2		.28	
	3	.06		
5	1		.27	
	2	.14		
	3	.22		
6	1	-.11		
	2		.40	
	3	.08		

-1.00 to - .75 High correlation
 - .74 to - .25 Moderate correlation
 - .24 to + .24 Low correlation
 + .25 to + .74 Moderate correlation
 + .75 to +1.00 High correlation

SUMMARY OF THE RESULTS AND ANALYSES

A Likert-type questionnaire designed to determine if a subject was made aware of a specific learning task, if the subject was made willing to tolerate the specified learning task, and if the subject was made willing to submit controlled attention to the specific learning task was administered to three experimental groups after the presentation of a rheostatically controlled visual subliminal. The research design also allowed for a determination of the correlation of the effectiveness of the stimulus toward non-specified learning tasks.

ANOVA

A one-way analysis of variance was used to compare the results of the three levels of responses to each slide between each experimental group and the control group. A t-test for independent means was incorporated to compare the three sections of each question.

The comparison between the control group (1) and the neutral stimulus experimental group (2) yielded no statistically significant difference on either of the levels testing the subjects awareness of his willingness to receive, nor his willingness to submit controlled attention to a subliminally specified learning task.

The comparison between the control group (1) and the drive-related (death) stimulus experimental group (3) yielded no statistically significant differences on either of the three levels testing the subjects awareness of, his willingness to receive, nor his willingness to submit controlled attention to a subliminally specified learning task.

The comparison between the control group (1) and the drive-related (sex) stimulus experimental group (4) yielded no statistically significant differences on either the level testing awareness of the existence of the learning task or the willingness to receive the learning task, but did yield a statistically significant difference ($<.05$) on the subjects willingness to submit controlled attention to

the learning task.

Pearson Product-Moment r

The correlation between results observed of the affect of rheostatically controlled visual subliminal toward a specific learning task and learning tasks not subliminally prescribed was tested using the Pearson Product-Moment r statistic. This correlation did not yield a statistically significant difference.

Hypothesis X

Hypothesis X stated that there would be no statistically significant correlation between learner attitudes subliminally prescribed and learning tasks not subliminally prescribed. The learning task subliminally prescribed consisted of a study of the Dalai Lama. The learning tasks not subliminally prescribed consisted of: (1) a photograph of a super-realistic sculpture of a man sitting on a chair; (2) a close-up of a super-realistic painting of a man; (3) a long-shot of Mata Hari; (4) a close-up of a super-realistic painting of a woman; and (5) a long-shot of Rasputin.

The posttest consisted of a Likert-type scale on which the subject was asked to make a choice as to the statement most closely akin his own feelings. The data were gathered and the correlation between choice on the subliminally prescribed learning task and the learning tasks

not subliminally prescribed within each group was computed using the Pearson Product-Moment, r . The statistically significant level was set at .75 or above, or -.75 level or below. Since none of the correlations were higher than .71, this null hypothesis failed to be rejected.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine if the receiving level of the affective domain of learners could be affected by the presentation of rheostatically controlled visual subliminals. A sub-problem to the study was whether a learner's attitude toward learning tasks, other than the task prescribed by the content of the subliminal stimulation, could be affected by the presentation of rheostatically controlled visual subliminals.

SUMMARY OF THE EXPERIMENTAL DESIGN

A Likert-type questionnaire was administered as a posttest to subjects in each of four groups. The questionnaire was designed to be an instrument to test a learner's receiving affective stimuli.

Group 1 was a control group and had not received a subliminal stimulus. Group 2 was an experimental group receiving a neutral subliminal stimulus, Group 3 was an experimental group receiving a drive-related (death)

stimulus, and Group 4 was an experimental group receiving a drive-related (sex) stimulus.

Data were collected, recorded on computer punch cards, and analyzed by the Biomed package.

The principal independent variables in the study consisted of the message and the orientation of each subject within each group. The dependent variables were the subjects attitudes toward a learning task.

Significant relationships between the control group and each of the experimental groups toward a learning task were statistically determined by using a one-way analysis of variance to compare the group means. Significance was set at the .05 level. Within each group the correlation between the motivational level of the prescribed learning task and other learning tasks was made using the Pearson Product-Moment correlation, r . Significant correlation was determined at the .75 value, moderate correlation was the .25 - .74 value, and .24 and below was considered of no significant correlation.

SUMMARY OF RESULTS

There was no statistically significant difference between the control group and with the neutral stimulus group or the drive-related (death) stimulus group as to their knowledge of the existence of a learning task, their willingness to receive a learning task, or their willing-

ness to submit controlled attention to a learning task.

Between the control group and the experimental drive-related (sex) group, however, there was a statistically significant difference. Learners within the experimental drive-related (sex) group exhibited a statistically significant willingness to submit controlled attention to a learning task when compared to their counterparts in the control group.

There was no statistically significant correlation in learner attitudes toward learning tasks other than the task prescribed by the content of the subliminal stimulation.

TEST OF HYPOTHESES

Hypothesis I stated that there would be no statistically significant difference between the control group (1) and the neutral stimulus group (2) for knowledge of the existence of the learning task. The t -score of .34 was not significant at the .05 level. Therefore, Hypothesis I was not rejected.

Hypothesis II stated that there would not be a significant difference between the control group (1) and the neutral stimulus group (2) for the willingness to receive a learning task. A t -score of .30 was obtained and was not equal to or greater than the required 2.02 for significance at the .05 level. Therefore, Hypothesis II

was not rejected.

Hypothesis III stated that there would be no statistically significant difference between the control group (1) and the neutral stimulus group (2) for the submission of controlled attention to a learning task. The statistical comparison of the mean scores yielded a t-score of .03. Hypothesis III was not rejected as this score was less than the value needed for significance at the .05 level.

Hypothesis IV stated that there would not be a statistically significant difference between the control group (1) and the drive-related (death) stimulus group (3) for the knowledge of the existence of the learning task. This hypothesis was not rejected as the t-score of .70 was obtained. Hypothesis IV was not rejected as this score was less than the value needed for significance at the .05 level.

Hypothesis V stated that there would be no statistically significant difference between the control group (1) and the drive-related stimulus (death) group (3) for the willingness to receive a learning task. Hypothesis V was not rejected. A t-score of .60 was obtained and was not equal to the required value necessary for rejection .05 level.

Hypothesis VI stated that there would be no statistically significant difference between the control

group (1) and the drive-related stimulus (death) group (3) for the submission of controlled attention to a learning task. This was not rejected as the t -score of .35 was far below the required value necessary for significance at the .05 level.

Hypothesis VII stated that there would be no statistically significant difference between the control group (1) and the drive-related (sex) stimulus group (4) for the knowledge of the existence of the learning task. This, also, was not rejected. The obtained t -score of .21 was below the score necessary for rejection of the .05 level.

Hypothesis VIII stated that there would be no statistically significant difference between the control group (1) and the drive-related (sex) group (4) for the willingness to receive a learning task. This hypothesis was not rejected as the obtained t -score value of 1.24 was below that necessary to reject the hypothesis at the .05 level.

Hypothesis IX stated that there would be no statistically significant difference between the control group (1) and the drive-related stimulus (sex) group (4) for the submission of controlled attention to a learning task. This was rejected. A t -score of 2.17 was above the required 2.01 level necessary for rejection at the .05 alpha level.

Hypothesis X stated that there would be no statistically significant correlation between learner attitudes

subliminally prescribed and learning tasks not subliminally prescribed. With the statistical level set at .75 or above or -.75 level or below, using the Pearson Product-Moment, r . Since none of the correlations were higher than .71, this hypothesis was not rejected.

CONCLUSIONS

A significant question asked by the researcher in the initial planning stages of this project was whether or not visual stimulation could be utilized in an experiment conducted in a classroom environment. This question was further complicated by the parameters of Krathwohl's which insist in the necessity of subject's self initiative in the choice of selective attention in affective learning situations. Or in short, could the loosely structured environment of the classroom be made the tool of an empirical investigation in the affective process and was it possible to test subjects without the usual experimenter's demands that subjects look solely at a particular screen.

The review of the literature revealed that such experimentation, though a relatively untapped source of knowledge, was possible. The question of selective attention was solved by the many utilizations of subliminal stimuli as "incidental stimuli". Even if subjects were not giving direct attention to stimuli there was evidence of acknow-

ledge and behavioral effect. Steiner noted that within the framework of his study neither seating arrangement or eyesight seemed to be so big a variable as to show statistical effect.

Rear-screen projection was found to be an excellent choice for stimulation. Titchener and Pyle, in fact, chided Dunlap for not exclusively utilizing rear-screen techniques as they did in replicating his study. The empty screen was chosen, as opposed to covering it with some still or motion picture image. An image would attract attention, destroying selective attention choices and would have hindered the subliminal message. Veeder states that an empty screen would have been a more favorable technique than her approach to adding elements to a movie screening. Similarly, Goldstein and Barthol had to diffuse conscious images in order to allow the subliminal, incidental elements to show effect.

The rheostatically controlled slide projector was preferred over tachistoscopic or embedding-type alternatives. The rheostat allowed for a thirty minute, constant intensity subliminal exposure which was undetected by all subjects. Classes were allowed to be conducted as usual. Only the room was changed and it, too, was a classroom. Each class was given acceptable reasons for the classroom change days before the alteration. No subject was noticeably suspicious of the experimental situation and carried on

daily classroom activity.

Of the drive-related experimental stimuli used only the sexually related stimulus was found to have statistically significant effects. This, too, seems to be the most utilized motif in visual subliminal research. Associative response type studies looked for Freudian like sexual associations. Blum, Arey, Silverman, et al., Klein, et al., Smith, et al., and Veeder all concluded statistical evidence of the affective nature of subliminal sexually related stimulation. Veeder draws no conclusions about her death stimulus, but notes the effect of the sexual words and pictures. Eagle shows significant conclusions with death-aggressive type visuals but Gunthrie and Weiner take issue with Eagle that it was the structural form of his visuals rather than content that was being measured.

It follows that this study, too, would have greater difficulty producing statistical evidence of death-related drive reactions than those of sexually related stimuli. The experimenter concludes this is due to the intangibility of the death motif and the lack of universality in symbols to denote a death or aggressive type message.

The literature also infers the selective nature of the unconscious defenses. Words or symbols such as "Timid" or "Hersey's Chocolate" are of little threat to perceptual defenses. This, of course, points to the limitations of

subliminal stimulation as an affective tool. Only those messages which are deeply disturbing to the individual are strongly reacted upon by perceptual defenses. The question of a subject's peace of mind versus the importance of a particular affective learning task becomes obvious. Few classroom learning tasks would be worth the nightmare-type phenomenon recorded by Poetzl or more recently by Key of having sexually threatening stimuli awaiting release within the learner's unconscious.

Subliminal stimulation has shown itself to be a tool for the altering of attitudes. Its method, those of entering the unconscious via threatening stimulation, do demand close scrutiny when considered in educational applications. Yet, the prospect of a rich untapped technique for student motivation needs much further exploration. For with further knowledge of the phenomena of subliminal stimulation will come the further understanding of the conscious and unconscious mind of man. To know the mind of man is the duty of the educator. For only through such knowledge can he effectively teach that mind.

The classroom today, as yesterday, is the heart of current learning experience. For this reason it is here that experimentation is needed to clearly define a role for subliminal stimulation as a possible affective technique. The utilization of the rheostat is the first step in developing a format for possible use of visual

stimulation within a classroom setting. Its ease of use, constant long term intensity, and low cost factor are suited for an educational format. Further experimentation in the effects of subliminal stimulation within the classroom need to be done to formulate research based instructional design strategies and curriculum for effective classroom use.

RECOMMENDATIONS FOR FURTHER STUDY

1. Further research should be done to compare the affective influences of different time durations of exposure to visual subliminal stimuli via the rheostat within the classroom environment.
2. Further, research should be done to compare the affective influences of different light intensities of visual subliminal stimuli via the rheostat within the classroom environment.
3. Another area which should be investigated is the differences in the affective influences of special populations to rheostatically controlled visual stimulation within the classroom environment.
4. Also, the area of differences in the affective influences of age groups to rheostatically controlled visual. Stimulation within the classroom environment should be studied.

5. Experimentation needs to be carried out to investigate the Poetzl effect and the affective influences and retention aspects of subjects to rheostatically controlled visual stimulation within the classroom environment.

6. Investigations are recommended to determine the influences of rheostatically controlled visual stimuli in regard to cognitive and psycho-motor domains.

7. Finally when questions of duration, intensity, characteristic strategies for certain individuals and groups of learners, and memory attention factors have been studied, an effort needs to be made to develop research tested methods of applying rheostatically controlled subliminal stimulation techniques to already existing findings within the confines of instructional design.

In all seven of these recommendations, one continuing thread is obvious. These recommendations are all necessary steps to begin systematically incorporating visual subliminal stimulation into efficient instructional design. Duration is the first question. Most previous studies dealt with stimuli being tachistoscopically presented with split-second intervals of presentation. The rheostat opens the door to long-term constant intensity low-light stimulation. Accordingly optimum intensities are also a question to be investigated in the light of instruction.

The characteristics of the perceiver must be understood. Already Silverman and Arey have done work with schizophrenics, stutters, and homosexual populations. To define rules for effective instructional design such studies need to be carried out for special populations utilizing the rheostat within the classroom. Age is another factor. Perky¹, as far back as 1910, found that children were as much influenced by subliminal stimulation as adults in his studies of the imagination. Currently Key is suggesting that death motifs are utilized within whiskey and cigarette commercials to capitalize on adolescent death wishes.² Even such variables as intelligence are in need of investigation. Krech and Calvin found subjects with higher Weschler Vocabulary Scores, an IQ test, did better at perceiving patterns presented at close to threshold level.³

To best design instructional strategies the effect on subjects must be known. The lasting effect of Poetzl's must be examined to find what type learning tasks are

¹C. W. Perky, "An Experimental Study of the Imagination," American Journal of Psychology, 21 (1910), pp. 442-452.

²W. B. Key, Media Sexploitation, (New York: New American Library, 1976), p. 159.

³D. Krech and A. Calvin, "Levels of Perceptual Organization and Cognition," Journal of Abnormal and Social Psychology, 48 (1953), pp. 394-400.

remembered and how long these lessons are retained. While comprehensive learner analysis is still within its infancy, there does exist several techniques of establishing learner characteristics. There will be a need for analysis of subliminal stimulation experimentation to find where rheostatically controlled visual stimulation fits in learner analysis theory.

Finally, affective, cognitive, and psycho-motor learning domains are overlapping. To best serve education the subliminal techniques suggested should be reviewed in regards to an overall view of learning theory.

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APPENDIXES

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APPENDIX A
QUESTIONNAIRE

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Instructions: Circle the letter choice which most corresponds with your reaction to each question.

QUESTIONNAIRE

GROUP _____

SLIDE NUMBER _____

1. My reaction to this figure is that:
 - A.) It definitely exists.
 - B.) It could possibly exist.
 - C.) It could equally exist or not.
 - D.) It probably does not exist.
 - E.) It does not exist.

2. If it were strictly up to me:
 - A.) I would definitely prefer learning about this figure.
 - B.) I would be slightly inclined toward learning about this figure.
 - C.) I am indifferent to learning about this figure.
 - D.) I would be slightly inclined to avoid learning about this figure.
 - E.) I would avoid learning about this figure.

3. If it were purely my decision:
 - A.) I would make an effort to study this figure.
 - B.) I would have some desire to study this figure.
 - C.) I would not care one way or the other about studying this figure.
 - D.) I would probably avoid study of this figure.
 - E.) I would make an effort to avoid study of this figure.

APPENDIX B

FIGURES 1 THROUGH 9



Figure 1. Super-realistic sculpture of a man sitting in a chair



Figure 2., Unaltered Presentation of Dalai Lama



DALAI LAMA

Figure 3. Neutral Stimulus Presentation of Dalai Lama



Figure 4. Drive-related Death Stimulus Presentation of Dalai Lama



Figure 5. Drive-related Sex Presentation of Dalai Lama



Figure 6. Super-realistic Painting of Mustachioed Anonymous Male



Figure 7. Presentation of Mata Hari



Figure 8. Super-realistic Painting of an Anonymous Female



Figure 9. Presentation of Rasputin